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Docket No.: 5000-0174PUS1  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Thomas GROTE et al.

Application No.: 10/580,039

Confirmation No.: N/A

Filed: May 19, 2006

Art Unit: N/A

For: FUNGICIDAL MIXTURES FOR  
CONTROLLING RICE PATHOGENS

Examiner: Not Yet Assigned

**LETTER**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Subsequent to the filing of the above-identified application on May 19, 2006, attached hereto is an English Translation of the International Preliminary Report on Patentability issued by the International Bureau on behalf of the International Searching Authority. Please make this document of record for the above-identified application

Application No.: 10/580,039

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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or to credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Dated: October 17, 2006

Respectfully submitted,

By 

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Attachment(s)

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 0000055100	<b>FOR FURTHER ACTION</b>	See item 4 below
International application No. PCT/EP2004/013065	International filing date ( <i>day/month/year</i> ) 18 November 2004 (18.11.2004)	Priority date ( <i>day/month/year</i> ) 27 November 2003 (27.11.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant BASF AKTIENGESELLSCHAFT		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 10 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Box No. I | Basis of the report   |
| <input type="checkbox"/> Box No. II           | Priority  |
| <input type="checkbox"/> Box No. III          | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/> Box No. IV           | Lack of unity of invention  |
| <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> Box No. VI           | Certain documents cited   |
| <input type="checkbox"/> Box No. VII          | Certain defects in the international application  |
| <input type="checkbox"/> Box No. VIII         | Certain observations on the international application   |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. +41 22 338 82 70	Date of issuance of this report 29 August 2006 (29.08.2006)
	Authorized officer  Agnes Wittmann-Regis  e-mail: pt06@wipo.int

# PATENT COOPERATION TREATY

TRANSLATION

From the  
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing **See form PCT/ISA/210**  
(day/month/year)

Applicant's or agent's file reference  
**0000055100**

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
**PCT/EP2004/013065**

International filing date (day/month/year)  
**18.11.2004**

Priority date (day/month/year)  
**27.11.2003**

International Patent Classification (IPC) or both national classification and IPC  
**A01N43/90**

Applicant  
**BASF AKTIENGESELLSCHAFT**

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/013065

Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language  
\_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/013065

Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-11	YES
	Claims		NO
Inventive step (IS)	Claims	1-11	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-11	YES
	Claims		NO
2. Citations and explanations:			
<p>Reference is made to the following citations (D1-D7) in the international search report:</p>			
D1: EP 0 988 790 A			
D2: WO 98/46607 A			
D3: US 5 939 454 A			
D4: US 6 268 371 B1			
D5: US5593996A			
D6: DE 35 35 664 A1			
D7: SINGH U D et al. "Individual and Combined Effects of Certain Pesticides on Rhizoctonia solani, Sheath Blight Pathogen of Rice", JOURNAL OF PHYTOPATHOLOGY (BERLIN), Vol. 119, No. 3, 1987, pages 240-247			
<b>Novelty</b>			
The subject matter of claims 1-11 is novel (PCT Article 33(1) and (2)).			
The subject matter of independent claim 1 are fungicidal mixtures for controlling rice pathogens, containing a dithiocarbamate selected from the group of Mancozeb,			

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/013065

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

Maneb, Metiram, Zineb and Thiram, and a specific fungicidal triazolopyrimidine (referred to in the following as TP1) in a synergistically effective amount. Claim 4 claims a means containing a carrier and the mixture. The other independent claims 5, 10 and 11 relate to a method for controlling rice-pathogenic fungi on seeds resulting from such a method by means of such a mixture, said seeds containing such a mixture, or to the use of the two compounds to produce means for controlling rice pathogenic fungi.

None of the citations referred to discloses the specific mixtures that form the subject matter of the present application.

D1 discloses (see the passages cited in the international search report) synergistic mixtures of triazolopyrimidines having a general formula, which also includes TP1, with other fungicides, including Mancozeb. The azolopyrimidines A, B and C preferred and used in examples (referred to in the following as TPa, TPb and TPc) are the 6-(2-Cl-6-F-phenyl)-, the 7-(2,2,2-trifluorethylamino)- and the 7-(1,1,1-trifluoropropyl-2-yl-amino) analogs of TP1. In the example (D1, example 26) TPc, the substance corresponding to substance B of the present application, is used in combination with Mancozeb on *Alternaria solani* found on tomatoes.

D2 specifically discloses (see the passages cited in the international search report), *inter alia*, the compound TP1 (the compound in example 2). This compound is compared to Tpa with regard to its effects on powdery

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/013065

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
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mildews on grapes, and found to be superior. The possibility of mixing the compounds with other fungicides, with Mancozeb, Maneb, Thiram and Zineb among those listed, in order to achieve a synergistic effect under certain conditions is mentioned in the document by not realised.

D3 discloses (see the passages cited in the international search report) synergistic mixtures of certain fungicidal oxime ether strobilurines with dithiocarbamates selected from Mancozeb, Maneb, Metiram and Zineb for controlling many fungal diseases that also include rice diseases caused by *Pyricularia oryzae*. However, this possibility is not given any special emphasis, and the only example relates to the control of *Phytophthora infestans* (oomycetes) on tomatoes.

D4 discloses (see the passages cited in the international search report) synergistic mixtures of triazolopyrimidines, known from D4 *inter alia*, with melamine biosynthesis inhibitors such as carpropamide, pyroquilon and fenoxanil. These mixtures are specifically effective against rice pathogens (*Pyricularia oryzae*, *Rhizoctonia solani* and *Cochliobolus miyabeanus*, which causes brown spot disease). The preferred compounds referred to in D5 as azolopyrimidines A, C and D are identical to the TPa, TPb and TPc compounds referred to above.

D5 discloses (see the passages cited in the international search report) certain fungicidal triazolopyrimidines, including TPa. The effect on *Pyricularia oryzae* on rice



WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/013065

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

is demonstrated (see D4, examples 225 and 226).

D6 discloses (see the passages cited in the international search report) certain fungicidal imidazolinyl pyridines that are claimed to have a stronger fungicidal effect than Zineb, which is similar in effect. This enhanced effectiveness is demonstrated with the control of *Pyricularia oryzae* on rice.

Finally, D7 discloses (see the passages cited in the international search report) the effect of some herbicides, insecticides and fungicides on the mycelial growth and on the formation and germination of sclerotia of *Rhizoctonia solani* (synonyms: *R.s.f.sp. sasakii*, *Corticium sasakii*, *Thanatephorus cucumeris*). The insecticide fenitrothion and the herbicide thiobencarb are significantly effective. The fungicides carbendazim and toclofos-methyl inhibit also completely. Mancozeb is less effective on its own than the latter, but has synergistic effects in combination with the herbicide thiobencarb.

**Inventive step**

The subject matter of claims 1-11 involve an inventive step (PCT Articles 33(1) and (3)).

In light of the description and the closest prior art in citation D1, the problem addressed by the application is considered that of providing synergistic mixtures of triazolopyrimidines with other fungicides, said mixtures combining a high level of systemicity and good efficacy against pathogens such as *Pyricularia oryzae*, *Rhizoctonia*

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/013065

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
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*solani* and *Cochliobolus miyabeanus*.

The proposed solution is characterised in the use of the specific triazolopyrimidine TP1 in combination with a dithiocarbamate selected from Mancozeb, Maneb, Metiram, Zineb and Thiram.

In view of the prior art presented above, this combination is not an obvious solution to the problem being addressed.

D1 proposes mixtures comprising triazolopyrimidines having a general formula that includes not only TPa, TPb and TPc but also TP1, and Mancozeb. What is specifically disclosed in that document is the mixture with the triazolopyrimidine TPc. The citation does not explicitly mention the use of such mixtures for controlling rice pathogens.

However, the triazolopyrimidines with this general formula are known from citation D5 to be effective against rice pathogens; in the latter document, the effectiveness of TPa (compound 139 in D5) against *Pyricularia oryzae* is demonstrated by way of example (see example 226).

Synergistic mixtures of such triazolopyrimidines, including TPa again and the TPc compound used as a similar substance in the present application, with other fungicides are known from D4 (see above). These mixtures are specifically effective against rice pathogens such as *Pyricularia oryzae*, *Rhizoctonia solani* and *Cochliobolus miyabeanus*.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/013065

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
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It is emphasised in D2 (see D2, page 7, lines 9-11) that the 6-(2,4,6-trifluorophenyl)-triazolopyrimidines disclosed therein (such as TP1, for example) have enhanced systemicity and greater fungitoxicity against rice pathogens than the triazolopyrimidines known from D5 (such as TPa and TPc, for example). The good efficacy, especially of TP1, against *Pyricularia oryzae* (= *Pyricularia grisea* f. sp. *oryzae*, teleomorph: *Magnaporthe gr. f. sp. oryzae*) and *Rhizoctonia solani* is shown in examples (see D2, table II).

In D2 there is also proposed a mixture with other fungicides, including dithiocarbamates of the present application, which can potentially result in a synergistic effect (see the passages from citation D2 quoted in the search report).

However, in order to proceed from D1 as a basis to the combination according to the present invention, it is necessary not only to specifically replace one of the triazolopyrimidines preferred in D1, e.g. TPc, with the TP1 mentioned alongside other triazolopyrimidines in D2, but also to select for this combination, from among all the combinations mentioned in D1, only those involving dithiocarbamate such as Mancozeb. Such a selection is not obvious with regard to the problem being addressed, namely to provide means for controlling rice pathogens. The dithiocarbamates Mancozeb, Maneb, Metiram, Zineb and Thiram are not known as being particularly effective against such pathogens (see D3, D6 and D7, for example). Although *Pyricularia oryzae* is mentioned as a pathogen that can be controlled with the mixtures in D3, the mixtures have only been tested on tomatoes against

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/013065

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
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*Phytophthora infestans* (oomycetes = phycomycetes), a "fungus" that is to be classified among algae rather than fungi.

The person skilled in the art would therefore be more likely to use known fungicides known for their effectiveness against rice pathogens in such mixtures, for example the melamine biosynthesis inhibitors mentioned in D4, or the active substances referred to in D6 and D7.

The proposed solution of combining the triazolopyrimidine TP1 with a dithiocarbamate selected from Mancozeb, Maneb, Metiram, Zineb and Thiram is therefore not obvious.

**Industrial applicability**

The subject matter of claims 1-11 is considered to be industrially applicable (PCT Article 33(1) and (4)).